

-continued

&lt;400&gt; SEQUENCE: 5

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25

&lt;210&gt; SEQ ID NO 6

&lt;211&gt; LENGTH: 27

&lt;212&gt; TYPE: DNA

&lt;213&gt; ORGANISM: Artificial Sequence

&lt;220&gt; FEATURE:

&lt;223&gt; OTHER INFORMATION: synthetic oligonucleotide

&lt;400&gt; SEQUENCE: 6

cgccctcaaag tgctggggatt acaggcg

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What is claimed is:

1. A method for quantifying an unamplified double stranded target nucleic acid in a sample fluid containing or suspected of containing the unamplified double stranded target nucleic acid, comprising:

combining in a microfluidic channel located in a biochip, said biochip further comprising a plurality of microfluidic channels and active areas for sample manipulation, at least a portion of the sample fluid and a probe fluid containing a binding agent comprising a signaling moiety to form a test fluid;

heating said test fluid to denature the unamplified double stranded target nucleic acid and cooling said test fluid to bind the binding agent to the denatured unamplified target nucleic acid;

maintaining the test fluid stationary in the microfluidic channel at a detector region;

detecting the signaling moiety in the test fluid at said detector region; and

quantifying the denatured unamplified target nucleic acid in the test fluid based on the detected signaling moiety; wherein the denatured unamplified target nucleic acid in the test fluid is quantified within 1 minute of combining the portion of the sample fluid and said probe fluid.

2. The method of claim 1, wherein quantifying the denatured unamplified target nucleic acid comprises determining the concentration of the denatured unamplified target nucleic acid in the test fluid.

3. The method of claim 1, wherein the binding agent is a specific binding agent having unique specificity for the denatured unamplified target nucleic acid.

4. The method of claim 3, wherein the specific binding agent hybridizes to the denatured unamplified target nucleic acid.

5. The method of claim 4, wherein the specific binding agent is a molecular beacon probe.

6. The method of claim 1, wherein detecting the signaling moiety comprises irradiating the signaling moiety with a laser.

7. The method of claim 6, wherein the laser is a component of a system coupled to the biochip comprising the microfluidic channel.

8. The method of claim 1, wherein detecting the signaling moiety comprises detecting fluorescence.

9. The method of claim 1, wherein the unamplified double stranded target nucleic acid, if present, has a concentration less than 1 nanogram per microliter in the sample fluid or is present in a total amount of less than 1 nanogram in the sample fluid.

10. The method of claim 1, wherein the sample fluid comprises a forensic sample.

11. The method of claim 10, wherein the unamplified double stranded target nucleic acid is a human nucleic acid.

12. The method of claim 11, wherein the sample fluid further comprises a non-human, non-target nucleic acid.

13. The method of claim 11, wherein the unamplified double stranded target nucleic acid is the human Alu repetitive element.

14. A method for quantifying an unamplified double stranded target nucleic acid in a forensic sample fluid containing or suspected of containing the unamplified double stranded target nucleic acid, comprising:

combining in a microfluidic channel located in a biochip, said biochip further comprising a plurality of microfluidic channels and active areas for sample manipulation, at least a portion of the forensic sample fluid and a probe fluid containing a binding agent comprising a signaling moiety to form a test fluid;

heating said test fluid to denature the unamplified double stranded target nucleic acid and cooling the test fluid to bind the binding agent to the denatured unamplified target nucleic acid;

maintaining the test fluid stationary in the microfluidic channels at a detector region;

detecting the signaling moiety in the test fluid at said detector region; and

quantifying the denatured unamplified target nucleic acid in the test fluid based on the detected signaling moiety; wherein the denatured unamplified target nucleic acid in the test fluid is quantified within 1 minute of combining the portion of the forensic sample fluid and the probe fluid.

15. The method of claim 14, wherein quantifying the denatured unamplified target nucleic acid comprises determining the concentration of the denatured unamplified target nucleic acid in the test fluid.

16. The method of claim 14, wherein quantifying the denatured unamplified target nucleic acid comprises determining the total amount of the denatured unamplified target nucleic acid in the test fluid.

17. The method of claim 14, wherein the binding agent is a specific binding agent having unique specificity for the denatured unamplified target nucleic acid.

18. The method of claim 17, wherein the specific binding agent hybridizes to the denatured unamplified target nucleic acid.

19. The method of claim 18, wherein the specific binding agent is a molecular beacon probe.